

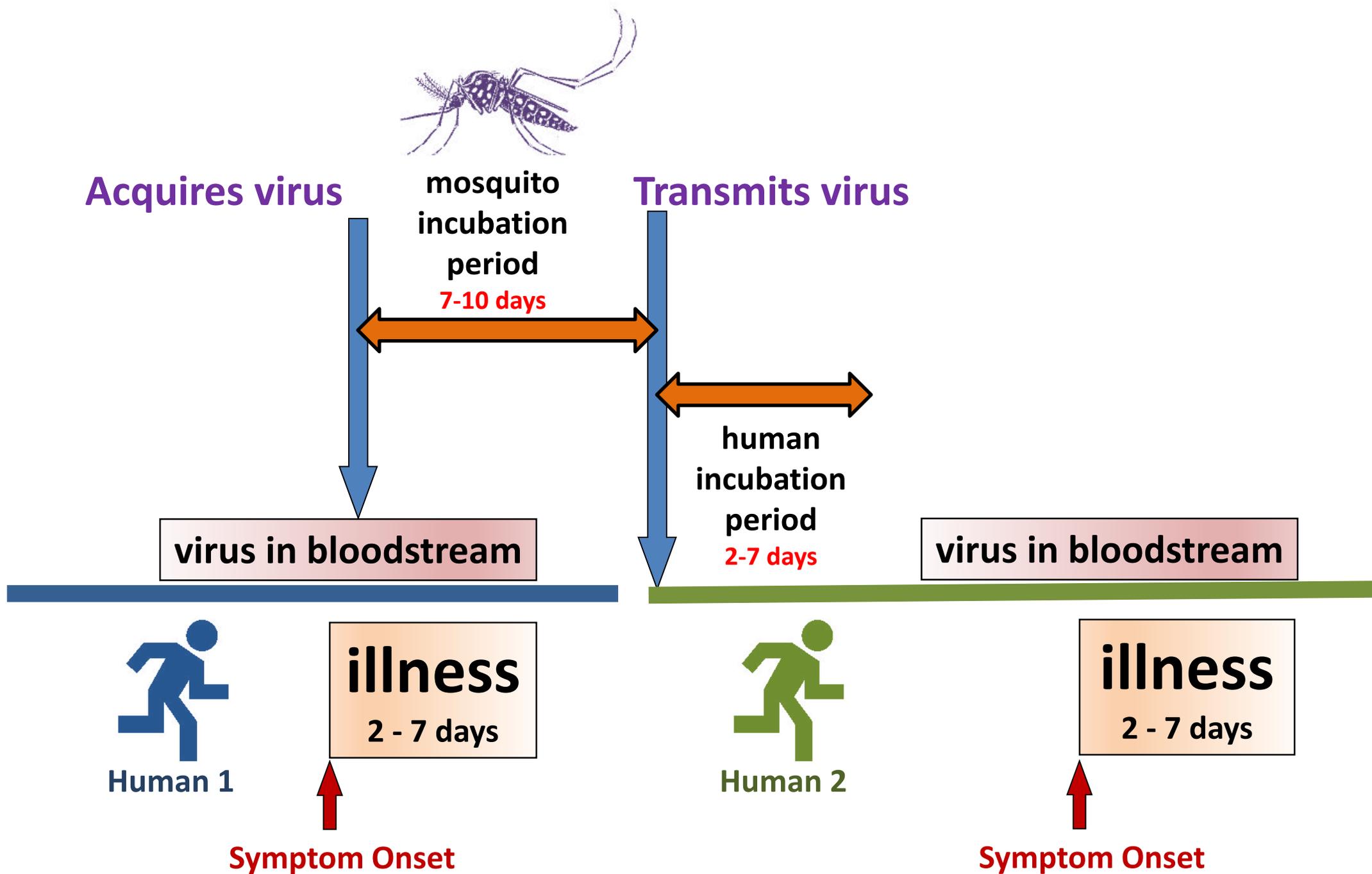


Mosquito Vectors of Zika Virus and Their Control

Chris Evans, MS, PhD
Public Health Entomologist

South Carolina Department of Health and Environmental Control

Promoting and Protecting the Health of the Public and the Environment



Mosquito Vectors of Zika Virus

Ten *Aedes* Species in Africa & the South Pacific

- *Stegomyia* group
 - *Ae. aegypti*, *Ae. africanus*, *Ae. albopictus*, *Ae. apicoargenteus*, *Ae. hensilli*, *Ae. luteocephalus*, and *Ae. polynesiensis*
- *Aedimorphus* group
 - *Ae. vittatus*
- *Diceromyia* group
 - *Ae. furcifer*, *Ae. taylori*

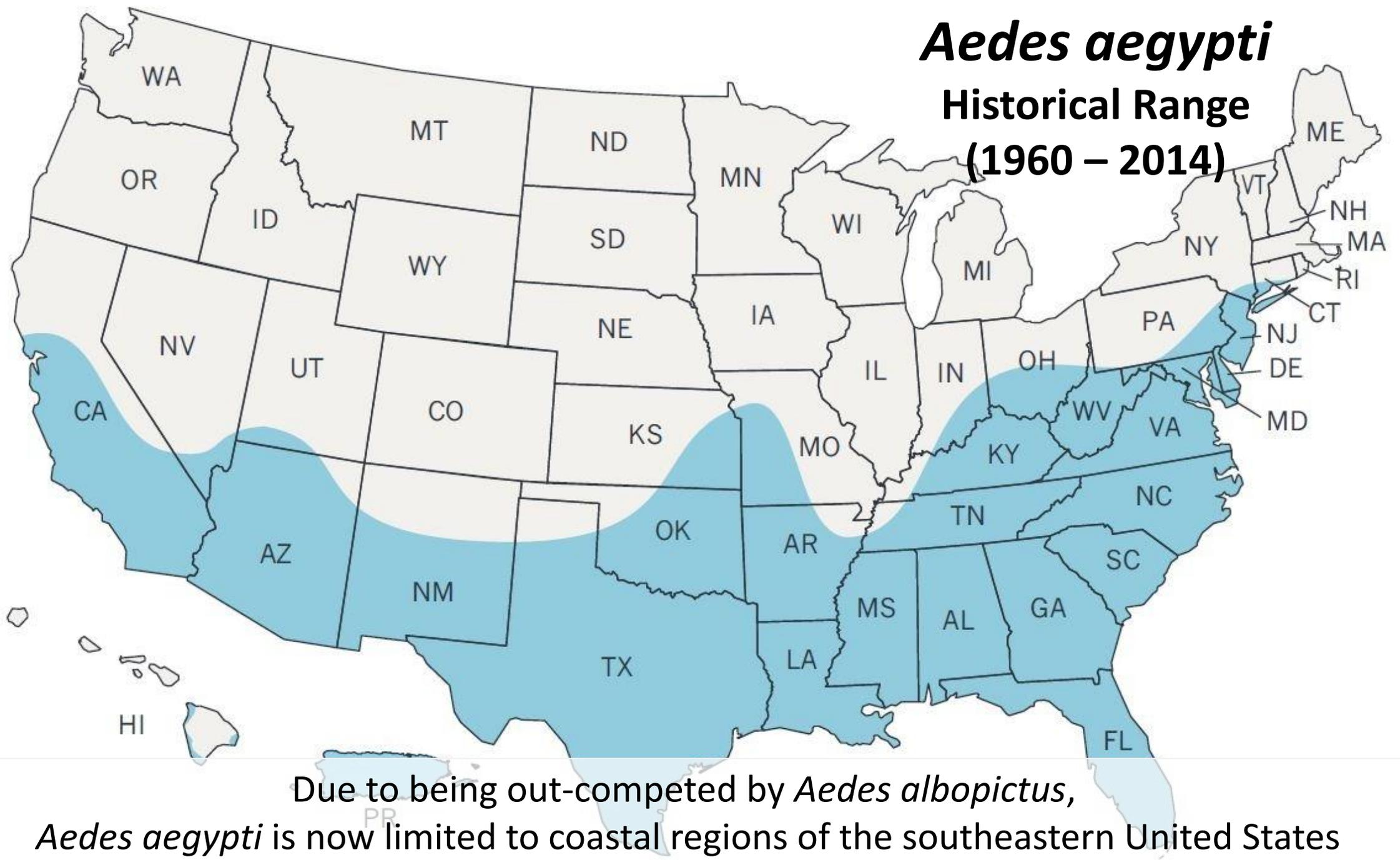


Aedes aegypti
Yellow Fever Mosquito



Feeds almost exclusively on people
Breeds and rests indoors and outdoors
Near human habitation

Aedes aegypti Historical Range (1960 – 2014)



Due to being out-competed by *Aedes albopictus*,
Aedes aegypti is now limited to coastal regions of the southeastern United States

Aedes aegypti Outdoor Breeding Urban Areas Near Human Habitation



Cemetery Vase



Water Storage



Waste Containers



Bird Baths



Discarded Tires

Aedes aegypti Indoor Breeding



Sik, Malaysia

Bathroom Container



Sik, Malaysia

Water Fountain

Aedes albopictus
Asian Tiger Mosquito



Opportunistic blood feeder, mostly mammals

Breeds and rests outdoors

Near human habitation or rural, wooded areas

Aedes albopictus Outdoor Breeding Sites Urban or Rural Areas

- Containers
 - Metal, glass, stone, earthenware, plastic, wood, or rubber
- Natural containers
 - Treeholes
 - Leaf axils (not common)
- Human-made containers
 - Flower pots
 - Cans
 - Buckets
 - Ornamental ponds
 - Birdbaths
 - Old tires
 - Cemetery vases
 - Clogged rain gutters
 - Pet watering dishes



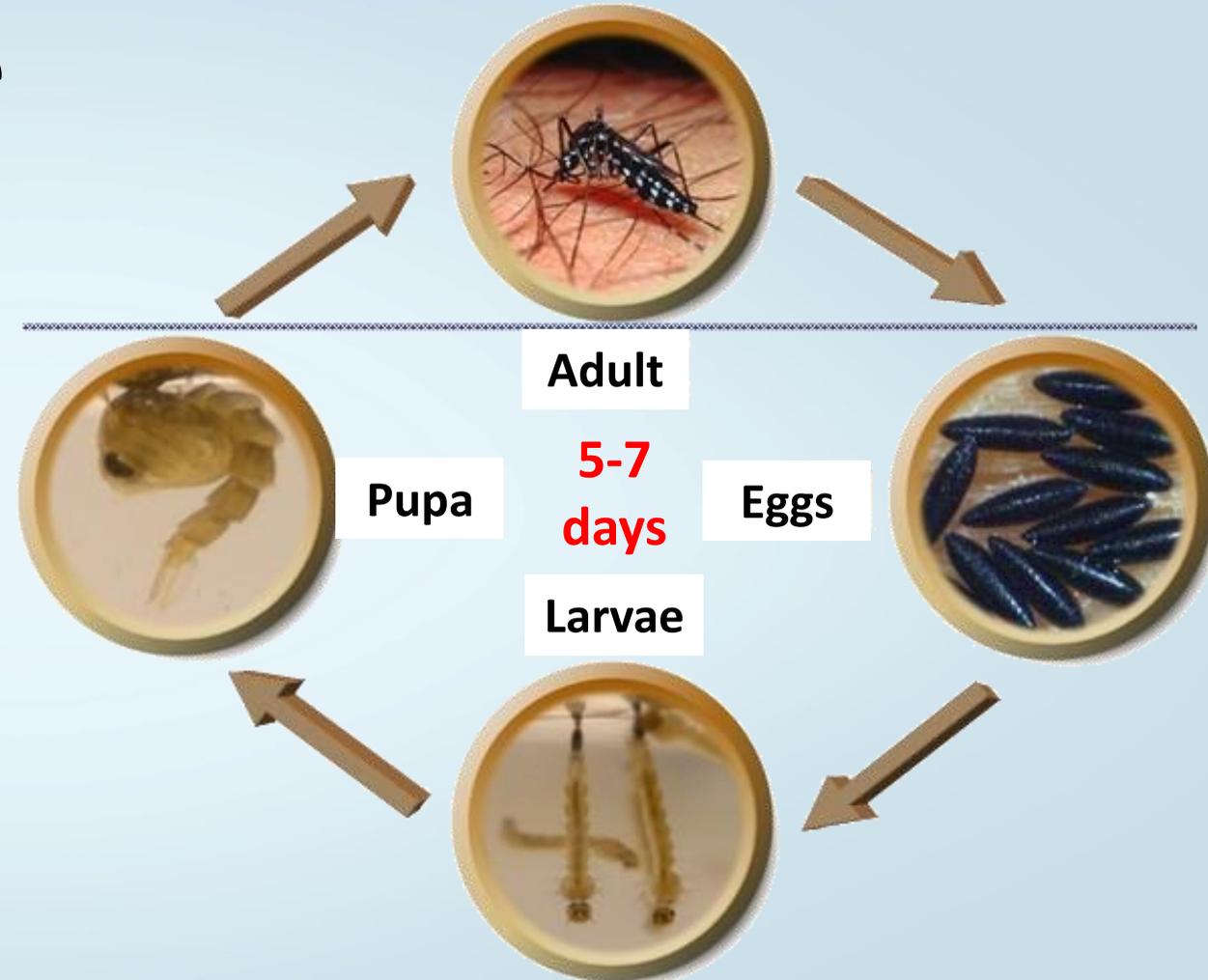


**Eliminate Mosquito Vectors
and Avoid Exposure**

Controlling Mosquito Larvae

Main Focus of Mosquito Control

- Mosquito larvae are
 - Confined to water and are easier to treat than adults
 - More vulnerable to control measures than the adults



Source Reduction

Removing sources of water that breed mosquitoes



Natural Containers

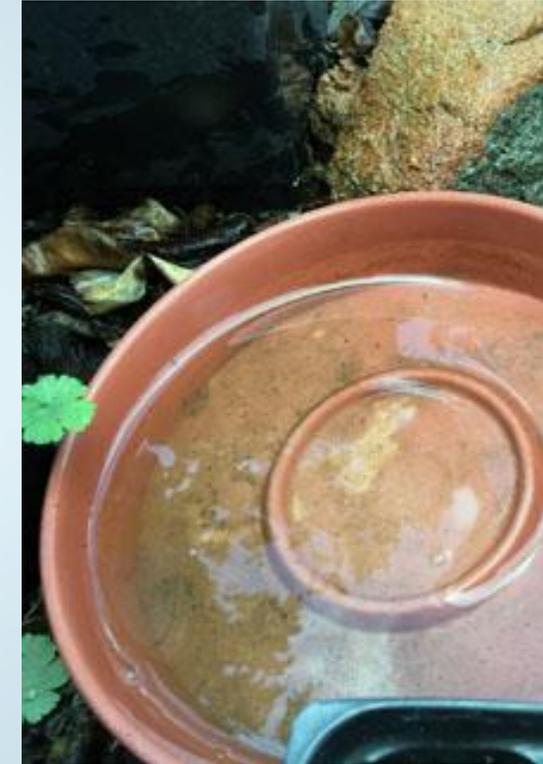


Tree Holes



Cut Bamboo

Artificial Containers



Plastic

Think Tall



Think Small



Recycling Waste Tires



Eliminates the need using expensive EPA-registered insecticides

Community Involvement in Source Reduction

“Man breeds his own *Aedes aegypti* and sits back either in ignorance or in the hope that someone else will do the tidying up.”

J.D. Gillett



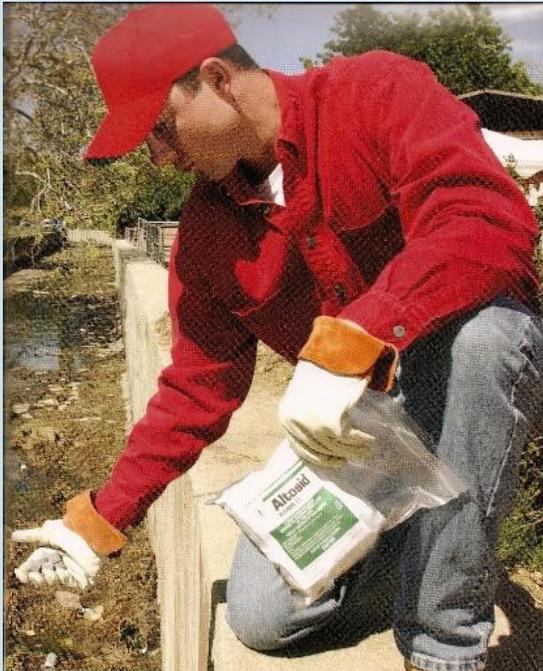
Educational Challenges

- Link larvae – “wrigglers” – with adult mosquitoes that might cause illness
- Stop dependence on government or other institutions to sustain source reduction activities



Larviciding

Process of killing mosquitoes by applying natural agents or commercial products to control larvae and pupae



Mosquito Control At Home



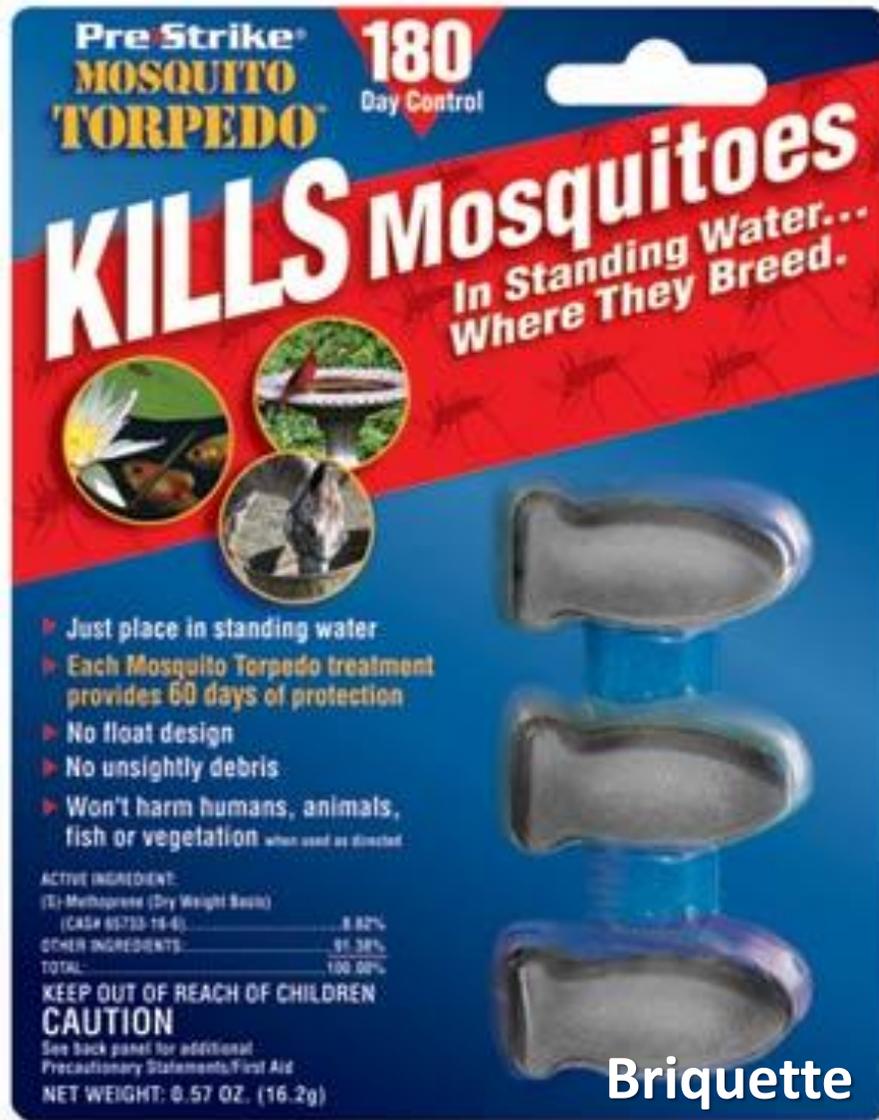
Bacillus thuringiensis israelensis – Bti

Bacterial toxins paralyzes the midgut of mosquito larvae



Mosquito Control at Home

Methoprene, an Insect Growth Regulator



Briquette

Methoprene, an Insect Growth Regulator
Mimics juvenile hormone &
prevents larvae from molting into pupae



Granules

Mosquito Repellents



EPA-Registered Active Ingredients

- DEET
- Picaridin
- IR3535
- Oil of Lemon Eucalyptus

Adult Mosquito Control – Adulthooding

- Source reduction or larviciding fails to control mosquitoes OR
- Outbreak already in progress



Ultra-Low Volume (ULV) Spraying

Use of nozzles to atomize the insecticide



Thermal Fogging

Use of heat to atomize the insecticide



Vehicle-mounted, Handheld, or Backpack versions available



Hand-held thermal fogger



Establishing a Mosquito Control Program

ASTHO's Recommendations

- **Level 1 (Minimal)**
 - *Minimal or no resources.* Emphasize education, community participation, and personal responsibility.
- **Level 2 (Intermediate)**
 - *Little to moderate resources.* Combine resources with other jurisdiction. Add increased source reduction and adulticide. Map habitats. Monitor larval & adult populations.
- **Level 3 (Comprehensive)**
 - *Moderate to full resources.* Procure equipment and insecticides. Expand data collection. Build risk maps and assign priorities to areas.

When to Notify Mosquito Control Programs of Zika-Virus Positive Events

Suspect or Confirmed Patient is viremic or infectious to mosquitoes while in South Carolina

YES

Weather/Time of Year is appropriate for mosquitoes to be present

YES

Local exposure to mosquitoes was likely

YES

Mosquito Control is Notified



South Carolina Department of Health and Environmental Control
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CONTACT US

www.scdhec.gov

(803) 898-DHEC (3432)



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Chris Evans

Public Health Entomologist

SC Dept of Health & Environmental Control

Bureau of Laboratories | Medical Entomology

8231 Parklane Rd | Columbia SC 29223

(P) 803.896.3802 | (F) 803.896.0983

EVANSCL@dhec.sc.gov